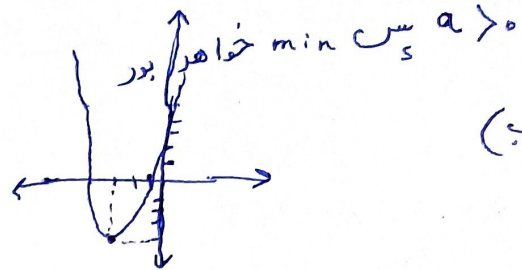


طول: $\frac{-b}{2a} \rightarrow \frac{-4}{2} = -2$
عرض: $(-2)^2 + 4(-2) + 5 = -3$

$\begin{bmatrix} -3 \\ -4 \end{bmatrix}$

(الف)

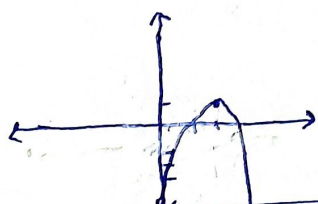


(ب)

طول: $\frac{-b}{2a} \rightarrow \frac{-4}{2} = -2$
عرض: 1

$\begin{bmatrix} 2 \\ 1 \end{bmatrix}$

(الف)



(ب) وقتی محور x را قطع کند یعنی $y=0$ پس داریم

$-x^2 + 4x - 3 = 0$ جمع فراب =

$x_1 = 1$
 $x_2 = -\frac{c}{a} \rightarrow \frac{-3}{-1} = 3$

$9 - 4(2a) > 0$

$9 - 8a > 0$

$a < \frac{9}{8}$

$a < \frac{9}{8}$

(الف) پس باید $\Delta > 0$ یعنی $b^2 - 4ac > 0$

$9 - 8a = 0$

$a = \frac{9}{8}$

(ب) پس $\Delta = 0$ یعنی $b^2 - 4ac = 0$

$9 - 8a < 0$

$a > \frac{9}{8}$

(ج) پس $\Delta < 0$ یعنی $b^2 - 4ac < 0$

$a \leq \frac{9}{8}$

(د) پس $\Delta \geq 0$ یعنی $b^2 - 4ac \geq 0$

(الف) $x^2 - 2x - 1 = 0$

$x^2 - 2x + 1 - 2 = 0 \rightarrow (x-1)^2 - 2 = 0 \rightarrow (x-1)^2 = 2 \rightarrow x-1 = \pm\sqrt{2}$

$x = \sqrt{2} + 1$

$x = -\sqrt{2} + 1$

(ب) $x^2 - x - 1 = 0$

$x^2 - x + \frac{1}{4} - \frac{5}{4} = 0 \rightarrow (x - \frac{1}{2})^2 - \frac{5}{4} = 0 \rightarrow (x - \frac{1}{2})^2 = \frac{5}{4}$

$x - \frac{1}{2} = \pm \frac{\sqrt{5}}{2} \rightarrow x = \frac{1}{2} \pm \frac{\sqrt{5}}{2}$

(الف) $x^2 - 2x - 1 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow \frac{2 \pm \sqrt{4 - 4(-1)}}{2} = \frac{2 \pm 2\sqrt{2}}{2} = 1 \pm \sqrt{2}$

$1 + \sqrt{2}$

$1 - \sqrt{2}$

(ب) $x^2 + x - 4 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow \frac{-1 \pm \sqrt{1 + 16}}{2}$

$\frac{-1 - \sqrt{17}}{2}$

$\frac{-1 + \sqrt{17}}{2}$

$$\text{الف) } x^2 - 11x + 21 = 0$$

$$(x-7)(x-3) = 0 \rightarrow x=7 \text{ , } x=3$$

$$\text{ب) } x^2 + 4x - 1 = 0$$

$$(x+1)(x-1) = 0 \rightarrow x=-1 \text{ , } x=1$$

$$\text{الف) } 5x^2 - 12x + 7 = 0$$

$$x^2 - 12x + 35 = 0$$

$$(x-7)(x-5) = 0 \rightarrow x = \frac{7}{5} \text{ , } x = \frac{5}{7} (=1)$$

$$\text{ب) } 4x^2 - 10x + 7 = 0$$

$$x^2 - 10x + 21 = 0$$

$$(x-7)(x-3) = 0 \rightarrow x = \frac{7}{3} \text{ , } x=1$$

$$\text{الف) } 2x^2 - 5x + 2 = 0$$

$$x^2 - 5x + 2 = 0 \rightarrow (x-2)(x-1) = 0 \rightarrow x=1 \text{ , } x = \frac{2}{1}$$

$$\text{ب) } 2x^2 + 5x + 2 = 0$$

$$x^2 + 5x + 2 = 0 \rightarrow (x+2)(x+1) = 0 \rightarrow x=-1 \text{ , } x = -\frac{2}{1}$$

$$\text{ج) } 2x^2 - 5x + 1 = 0 \rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{5 \pm \sqrt{17}}{4} = \frac{5 + \sqrt{17}}{4} \text{ , } \frac{5 - \sqrt{17}}{4}$$

$$\text{د) } 5x^2 + 7x + 9 = 0 \rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow -\frac{7}{5} \pm \sqrt{-\frac{94}{25}}$$

$$p = \frac{c}{a} \text{ , } s = -\frac{b}{a}$$

$$x^2 - 4x - 2 = 0$$

$$s = 4$$

$$p = -2$$

$$\text{الف) } s^2 - 2p$$

$$9 - 2(-2) = 13$$

$$\text{ب) } s^2 - 3sp$$

$$9 - 3(4 \times -2) = 21 - 3(-8) = 21 + 24 = 45$$

$$\text{الف) } \binom{7}{0} + \binom{9}{2} = \frac{7!}{0! \times 7!} + \frac{9!}{2! \times 7!} = \frac{7 \times 7}{2} + \frac{1 \times 9}{2} = 21 + 4.5 = 25.5$$

$$\text{ب) } \binom{9}{3} - \binom{1}{2} = \frac{9!}{3! \times 6!} - \frac{1!}{2! \times 1!} = \frac{9 \times 8 \times 7}{6} - \frac{1 \times 1}{2} = 84 - 0.5 = 83.5$$

$$14 - 21 = -7$$